Preliminary Amendment - Claim Listing

1. (Original) A method of handwriting text input on a portable terminal with a microprocessor, a screen, and a keypad area formed by at least one key, comprising of:

   Placing at least one sensing unit in the keypad area of the portable terminal to form a sensing surface;

   Writing, with a sensing object on the said sensing surface, at least partial information of a desired text, to form a trajectory of movement;

   Generating, via the said sensing unit, multidimensional coordinates data from the said trajectory of movement of the said sensing object on the said sensing surface;

   Generating, via the microprocessor of the portable terminal processing the said multidimensional coordinates data, at least one text candidate;

   Displaying at least one of the said at least one text candidate on the screen of the portable terminal;

   Selecting the said desired text from the said at least one text candidate by pressing at least one of the at least one key in the keypad area of the portable terminal;

   Displaying the said desired text on the screen of the portable terminal.

2. (Original) A method of claim 1, wherein the said partial information of the said desired text can be any of a stroke, a component, a partial character, a character, a word, a sentence, or their combination.

3. (Original) A method of claim 2, wherein the said partial information written with the said sensing object on the said sensing surface can be stroke or stroke combination of the said desired text, the said at least one text candidate generated from the said processing of the said multidimensional coordinates data and displayed on the screen of the portable terminal can include text component such as radical, letter and affix, further comprises the steps of:

   Selecting a text component from the said at least one text candidate by pressing at least one of the at least one key in the keypad area of the portable terminal;

   Generating, via the microprocessor of the portable terminal, at least one associated text candidate corresponding to the said selected text component;

   Displaying at least one of the at least one associated text candidate on the screen of the portable terminal, in place of the previous said at least one text candidate;

   If the desired text is not in display, the method could further comprise the steps of:

   Writing, with the said sensing object on the said sensing surface, at least one additional stroke or stroke combination of the desired text to form a new trajectory of movement, wherein the said additional stroke or stroke combination is not part of the said selected text component;

   Generating, via the said sensing unit, multidimensional coordinates data of the said at least one

additional stroke or stroke combination of the desired text from the said trajectory of movement of the said sensing object on the said sensing surface;

Generating, via the microprocessor of the said portable terminal processing the said multidimensional coordinates data and the said selected text component, at least one candidate text that may further include text component such as radical, letter and affix;

Displaying at least one of the said at least one candidate text on the screen of the portable terminal.

The above steps can be repetitively applied until the desired text is in display.

4. (Currently Amended) A method of claim 1 or claim 3, wherein the said sensing unit can be capacitive, generating multi-dimensional coordinates data through measuring the capacitance or the change of capacitance of the sensing unit.

5. (Canceled) A method of claim 1 or claim 3, wherein the said sensing unit can be resistive, generating multi-dimensional coordinates data through measuring the resistance or the change of resistance of the sensing unit.

6. (Canceled) A method of claim 1 or claim 3, wherein the said sensing unit can be inductive, generating multi-dimensional coordinates data through measuring the inductance or the change of inductance of the sensing unit.

7. (Canceled) A method of claim 1 or claim 3, wherein the said sensing unit is impedance based, generating multi-dimensional coordinates data through measuring the impedance or the change of impedance of the sensing unit.

8. (Currently Amended) A method of claim 1 or claim 3, wherein the said at least one key can be: push-down button, roller button, gliding wheel, rotational switch, optical sensing switch, or bridge-sensing switch.

9. (Currently Amended) A method of claim 1 or claim 3, wherein the said at least one key is located on the outer surface of the portable terminal.

10. (Currently Amended) A method of claim 1 or claim 3, wherein the said sensing unit is coupled with the said at least one key in the said keypad area of the portable terminal.

11. (Currently Amended) A method of claim 10, wherein the said coupling of the said sensing unit and the said at least one key in the said keypad area of the portable terminal can be electronically combining and sharing electronic circuit of the said sensing unit and that of the said at least one key.

12. (Currently Amended) A method of claim 10, wherein the said coupling of the said sensing unit and the at least one key in the said keypad area of the portable terminal can be mechanically combining and sharing the mechanical structure of the said sensing unit and that of a plurality of the said at least one key.

13. (Currently Amended) A method of claim 1 or claim 3, wherein the said sensing object can be:

human finger, input stylus or pen-shaped objects.

14. (Currently Amended) A method of claim 1 or claim 3, wherein the screen of the portable terminal has a text editor display area and a candidate text display area, further comprises the steps of:

Designating the most probable first candidate text as current text and displaying it in the text editor display area of the screen of the portable terminal;

Generating at least one associated candidate text of the said current text, wherein the generation is from the microprocessor of the portable terminal processing the knowledge of the said current text, wherein the said knowledge is retrieved from a knowledge base;

Displaying at least one associated candidate text in the candidate text display area of the screen of the portable terminal;

Selecting one of the said associated candidate text by pressing at least one key of the said at least one key, wherein the said associated candidate text can be character, word phrase, sentence or their combination;

Displaying the selected associated candidate text in the said text editor display area of the screen of the portable terminal.

15. (Currently Amended) A method of claim 1 or 3 or 14, wherein the said pressing of at least one key or key combination can be pressing numeric key; wherein the said selection of the desired text from the said candidate text can be to select the candidate text associated with a sequence number the same as the number marked on the said pressed numeric key, and wherein the said displaying of the selected text can be to display it in the text editor display area of the screen of the portable terminal.

16. (Currently Amended) A method of claim 1 or 3 or 14, wherein the selection of the desired text from the said candidate text by the said pressing of at least one key or key combination can be pressing at least one navigation functional key to move a cursor to a candidate text and pressing a confirm/select functional key to select this candidate text; and wherein the said displaying of the selected text can be to display it in the text editor display area of the screen of the portable terminal.

17. (Currently Amended) A method of claim 1 or 3, wherein the said generation of at least one candidate text of the desired text further comprises the step of pressing at least one of the said at least one key to delete at least one candidate text.

18. (Currently Amended) A method of claim 1 or 3, wherein the said generation of the at least one candidate text of the desired text, further comprises the step of pressing at least one of the said at least one key to change the order of the said at least one candidate text.

19. (Currently Amended) A method of claim 1 or 3, wherein the said generation of the at least one candidate text of the desired text, further comprises the step of pressing at least one of the said at least one key to insert at least one candidate text.

20. (Currently Amended) A method of claim 1 or 3, wherein the said sensing surface formed by printing the said sensing units on the surface area of the at least one key and the surface area between the said keys of the portable terminal.

21. (Currently Amended) A method of claim 1 or 3 or 20, wherein the said sensing unit is a contact switch.

22. (Currently Amended) A method of claim 1 or 3 or 20, wherein the said surface of the said at least one key can be the visible surface of the said key.

23. (Currently Amended) A method of claim 21, wherein the said contact switch is made of electrically conductive material and is connected to at least on resistor;

wherein the said sensing area is formed by arranging a plurality of the said contact switches as a matrix on the surface area of the said at least one key and the surface area between the said keys;

wherein each of the said contact switch is numbered and taken as a data sampling point;

wherein the said multi-dimensional coordinates data is generated by electronically coupling at least one of the said contact switches with a conductive sensing object electronically touching the said sensing surface;

wherein the said number of the at least one touched conduct switch is sent as coordinate data to the microprocessor of the portable terminal for processing;

wherein the said at least one key is triggered when the said conductive sensing object pressing the said key and causing electronic connection of the conductive switch;

wherein the microprocessor recognizes the pressed key and takes corresponding actions.

24. (Currently Amended) A method of claim 23, wherein the said contact switch is printed on the keypad area in shapes suitable for sensing.

25. (Currently Amended) A method of claim 23, wherein the said contact switch is printed on the keypad area in rectangular, circular, ovular, triangular, polygonal shape or other shapes suitable for sensing.

26. (Currently Amended) A method of claim 25, wherein contact switches of the same or different shapes are printed in the keypad area to form contact switch matrix.

27. (Currently Amended) A method of claim 25, wherein each sensing unit is a node of the said contact switch matrix.

28. (Currently Amended) A method of claim 25, wherein sensitivity of the sensing surface is dependent on the density of the said contact switch matrix.

29. (Currently Amended) A method of claim 1 or 3, wherein the said sensing units are placed under the surface of the said at least one key and under the surface area between the said keys of the portable terminal, to form sensing surface.

30. (Currently Amended) A method of claim 29, wherein the said sensing unit is made up of at least one contact switch made of electrically conductive materials, and each of the said contact switch is electronically connected to at least one resistor, at least one capacitance, and at least one diode to form a capacitive sensing component;

Wherein the said sensing surface is formed by at least one capacitive sensing unit placed as a matrix under the surface of the at least one key and the surface of the keypad area;

Wherein the said multidimensional coordinates data comes up when the said sensing object is placed on or near the said sensing surface in the keypad area to cause capacitive effects with the sensing units underneath, and when the said sensing object slides on the surface to form a trajectory of movement; the said multidimensional coordinates data is to be used by the microprocessor of the portable terminal for recognition process;

Wherein the said at least one key turns on when a finger-like object pushes the said key to cause a layer of conductive material inside the key to electronically connects the underneath contact switch; the microprocessor determines which key is pressed and carries corresponding functions.

31. (Currently Amended) A method of claim 1 or 3 or 21 or 29, wherein the said portable terminal is a mobile handset.

32. (Currently Amended) A method of claim 1 or 3 or 21 or 29, wherein the said keypad area can be the keypad area of a mobile handset.

33. (Currently Amended) A method of claim 1 or 3 or 21 or 29, wherein the said desired text can be in alphabetical letters, Chinese characters, Japanese characters, and other hieroglyphs and symbols.

34. (Currently Amended) A portable terminal with a keypad area formed by at least one key, further comprising:

A sensing surface, formed by at least one sensing unit placed in the keypad area of the portable terminal;

A sensing object, for writing at least partial information of a desired text on the said sensing surface, generating multidimensional coordinates data from the trajectory of the movement of the said sensing object via the said sensing unit;

A microprocessor, for processing the said multidimensional coordinates data and for generating at least one candidate text;

A screen, for displaying the said at least one candidate text;

The desired text can be selected from the said at least one candidate text by pressing the said at least one key, and be displayed on the said screen.

35. (Currently Amended) An apparatus of claim 34, wherein the said sensing unit can be capacitive, generating multi-dimensional coordinates data through measuring the capacitance or the

change of capacitance of the sensing unit.

36. (Canceled) An apparatus of claim 34, wherein the said sensing unit can be resistive, generating multi-dimensional coordinates data through measuring the resistance or the change of resistance of the sensing unit.

37. (Canceled) An apparatus of claim 34, wherein the said sensing unit can be inductive, generating multi-dimensional coordinates data through measuring the inductance or the change of inductance of the sensing unit.

38. (Canceled) An apparatus of claim 34, wherein said sensing unit is impedance based, generating multi-dimensional coordinates data through measuring the impedance or the change of impedance of the sensing unit.

39. (Currently Amended) An apparatus of claim 34, wherein the said at least one key can be: push-down button, roller button, gliding wheel, rotational switch, optical sensing switch, or bridge-sensing switch.

40. (Currently Amended) An apparatus of claim 34, wherein the said at least one key is located on the outer surface of the portable terminal.

41. (Currently Amended) An apparatus of claim 34, wherein the said sensing unit is coupled with the said at least one key in the said keypad area of the portable terminal.

42. (Currently Amended) An apparatus of claim 41, wherein the said coupling of the said sensing unit and the said at least one key in the said keypad area of the portable terminal can be electronically combining and sharing electronic circuit of the said sensing unit and that of the said at least one key.

43. (Currently Amended) An apparatus of claim 41, wherein the said coupling of the said sensing unit and the at least one key in the said keypad area of the portable terminal can be mechanically combining and sharing the mechanical structure of the said sensing unit and that of a plurality of the said at least one key.

44. (Currently Amended) An apparatus of claim 34, wherein the said sensing surface is formed by placing at least one sensing unit on the surface of the at least one key of the portable terminal and on the surface of the space between the said keys.

45. (Currently Amended) An apparatus of claim 44, wherein the said sensing unit is a contact switch.

46. (Currently Amended) An apparatus of claim 45, wherein the said sensing surface is formed by printing the said sensing units on the surface area of the at least one key and the surface area between the said keys of the portable terminal.

47. (Currently Amended) An apparatus of claim 34 or 44, wherein the said surface of the said at least one key can be the visible surface of the said key.

48. (Currently Amended) An apparatus of claim 46, wherein the said contact switch is made of electrically conductive material and is connected to at least on resistor;

wherein the said sensing area is formed by arranging a plurality of the said contact switches as a matrix on the surface area of the said at least one key and the surface area between the said keys;

5   wherein each of the said contact switch is numbered and taken as a data sampling point;

wherein the said multi-dimensional coordinates data is generated by electronically coupling at least one of the said contact switches with a conductive sensing object electronically touching the said sensing surface;

wherein the said number of the at least one touched conduct switch is sent as coordinate data to

10   the microprocessor of the portable terminal for processing;

wherein the said at least one key is triggered when the said conductive sensing object pressing the said key and causing electronic connection of the conductive switch;

wherein the microprocessor recognizes the pressed key and takes corresponding actions.

49. (Currently Amended) An apparatus of claim 48, wherein the said contact switch is printed on

15   the keypad area in shapes suitable for sensing.

50. (Currently Amended) An apparatus of claim 49, wherein the said contact switch is printed on the keypad area in rectangular, circular, ovular, triangular, polygonal shape or other shapes suitable for sensing.

51. (Currently Amended) An apparatus of claim 50, wherein contact switches of the same or

20   different shapes are printed in the keypad area to form contact switch matrix.

52. (Currently Amended) An apparatus of claim 44, wherein each sensing unit is a node of the said contact switch matrix.

53. (Currently Amended) An apparatus of claim 44, wherein the sensitivity of the sensing surface is dependent on the density of the said contact switch matrix.

25   54. (Currently Amended) An apparatus of claim 34, wherein the said sensing units are placed under the surface of the said at least one key and under the surface area between the said keys of the portable terminal, to form sensing surface.

55. (Currently Amended) An apparatus of claim 54, wherein the said sensing unit is made up of at least one contact switch made of electrically conductive materials, and each of the said contact switch is

30   electronically connected to at least one resistor, at least one capacitance, and at least one diode to form a capacitive sensing component;

Wherein the said sensing surface is formed by at least one capacitive sensing unit placed as a matrix under the surface of the at least one key and the surface of the keypad area;

Wherein the said multidimensional coordinates data comes up when the said sensing object is

placed on or near the said sensing surface in the keypad area to cause capacitive effects with the sensing units underneath, and when the said sensing object slides on the surface to form a trajectory of movement; the said multidimensional coordinates data is to be used by the microprocessor of the portable terminal for recognition process;

5   Wherein the said at least one key turns on when a finger-like object pushes the said key to cause a layer of conductive material inside the key to electronically connects the underneath contact switch; the microprocessor determines which key is pressed and carries corresponding functions.

56. (Currently Amended) An apparatus of claim 34 or 44 or 54, wherein the said portable terminal is a mobile handset.

10   57. (Currently Amended) An apparatus of claim 34 or 44 or 54, wherein the said keypad area can be the keypad area of a mobile handset.

58. (Canceled) An apparatus of claim 34 or 44 or 54, wherein the said desired text can be in alphabetical letters, Chinese characters, Japanese characters, and other hieroglyphs and symbols.